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A5R RBQ

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(56) Documents Cited

US 4682587 A US 4622957 A US 3343532 A

(58) Field of Search

UK CL (Edition O ) A3V V1B2C V9B5X , A5R RBQ

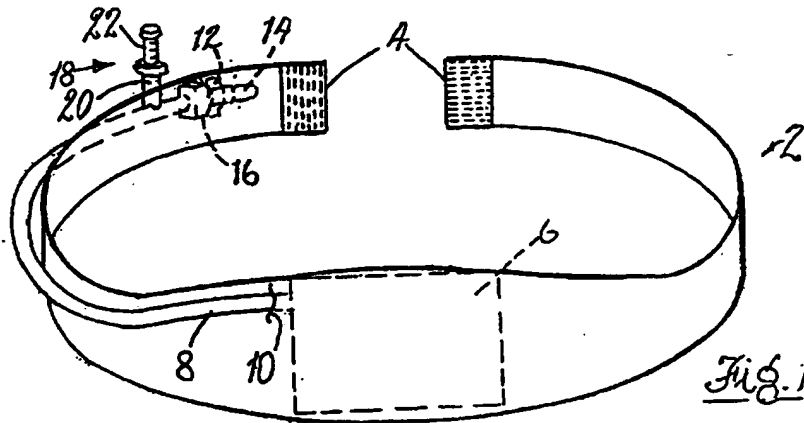
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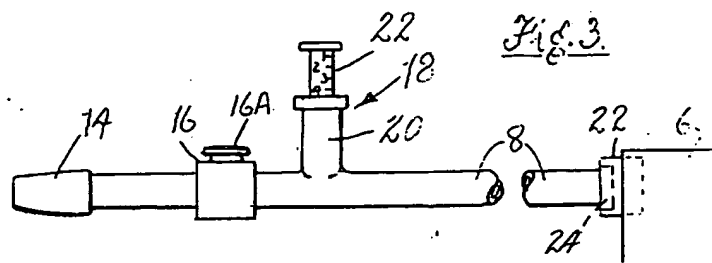
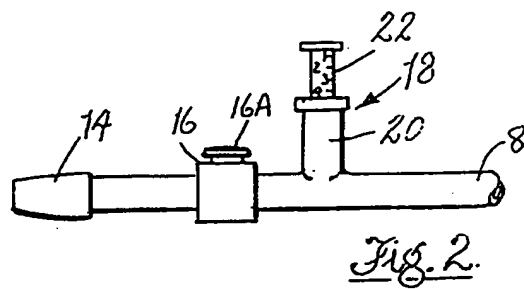
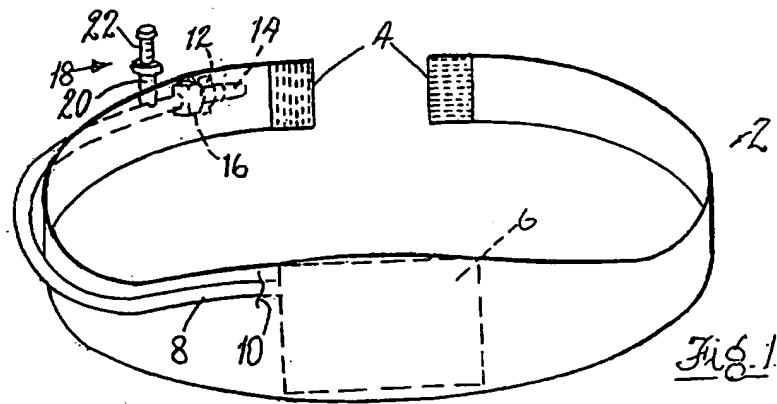
ONLINE: WPI, JAPIO, CLAIMS

(54) Inflatable lumbar-support belt with pressure gauge

(57) Lumbar support belt 2 has rear inflatable envelope 6 which is inflated by blowing air through mouthpiece 14, valve 16 and tube 8 which has a visual pressure gauge 18 enabling pressure in the envelope to be measured before or during wearing of the belt. Tube 8 with pressure gauge 18, valve 16 and mouthpiece 14 may be detached from the belt during use.



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A LUMBAR SUPPORT

This invention relates to devices for providing support to the lower back and is particularly but not exclusively concerned with providing adjustable support to the lumbar regions of a persons back in order to alleviate lower back pain and discomfort caused by sitting for long periods without adequate support to those regions.

It is known to provide a lumbar support device for the above purpose in the form of a detachable belt-like garment which incorporates one or more inflatable envelopes or bladders, and these may be inflated by simply blowing into them via a tube, or by means of a pump in the form of a bulb similar to that used by a doctor for inflating a blood pressure cuff. Such a pump may alternatively be actuated electrically e.g. by a motorcar cigar lighter power point. The fluid may be either air or water.

Examples of such lumbar supports are shown and described in British Patents 985591, 1520722, 1432945, European Patent 077760, US Patents 4622957, 4682587, 4703750, 4656306, 4836194 and 5349706.

Some of these describe how the pressure and volume of the fluid can be adjusted in order to provide the correct support to the user. However, the volume and pressure has to be preset before fixing the garment onto the wearer, or some may be further inflated or deflated when in position.

In none of the patents referred to is there any means for indicating the pressure within the fluid filled envelopes to enable the pressure to be preset to a predetermined amount.

It is an object of this invention to provide a back support for use by a wearer and which provides comfortable and effective support by means of inflatable envelopes contained within a user encircling belt and having means to readily indicate the degree of inflation within the envelopes.

In accordance with the invention there is provided a back-supporting device comprising a body encircling belt which incorporates therein at least one inflatable envelope adapted to provide support to the lumbar region of a user, means for inflating or deflating the envelope and indicator means for

providing an indication of pressure within the envelope.

The pressure indicating means may be visual or audible.

The visual means may be in the form of a graduated stem slidably mounted within a sleeve connected with the envelope or envelopes and caused to project from the sleeve by a predetermined amount according to the pressure of the fluid.

Other features of the invention will become obvious from the following description which is given by way of example only with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a back support according to the invention;

Figure 2 is a view showing a typical pressure indicating device for use with the device;

Figure 3 is a view of parts of an alternative embodiment.

As seen in the drawings the back support comprises a belt 2 provided at its ends with hook and loop type fasteners 4. Within a cavity formed in the rear portion of the belt is located a sealed impervious envelope 6, and a flexible tube 8 leads from the envelope to pass through a slit 10 and passes around to the front of the belt where it passes through and is retained in position by a loop 12.

The end of the tube 8 is provided with a mouthpiece 14 and a two-way valve 16 which may be actuated by a button 16A whereby the air may be locked within the envelope or released therefrom.

Also affixed to the tube towards its end is a pressure gauge 18 comprising a sleeve 20 and a spring controlled stem portion 22. Depending on the pressure of the air within the envelope, the stem will protrude to a certain degree out of the sleeve 20 and graduations on the stem will indicate what that pressure is and may be adjusted either by means of the valve 16 or

by blowing more air through the mouthpiece into the envelope.

In use, the belt is passed around the waist of the user and secured by means of the hook and loop type fasteners 4, e.g. "VELCRO" strips. The tube 8 is then released from its fastening within the loop 12 and air is blown into the envelope 6 via the mouthpiece 14 with the valve 16 opened by depressing the button 16A.

The pressure within the fluid filled envelope 16 may thus be adjusted to the pressure known to be most effective and comfortable and the user can take note of the best required pressure for use on future occasions. Therefore, the pressure within the envelope can be preset prior to donning the belt.

The belt 2 is preferably made of a thin flexible two-ply knitted fabric material, and the envelope 6 is fitted within a pocket. The flexible tube 8 is preferably made from an extruded plastics material and the pressure gauge 18 has its sleeve part 20 made from a rigid plastics material by e.g. injection moulding. The stem 22 may also be formed from a rigid plastics material or, preferably, of a metal, the graduations being engraved on its cylindrical surface.

In an alternative arrangement shown in Figure 3 the tube 8, pressure gauge 18, mouthpiece 14 and valve 16 are removable from the envelope 6 to present a more elegant appearance and allow more comfort during wear.

Thus, a self-sealing valve 22 is provided on the envelope 6 and a quick release connection arrangement 24 on the end portion of the tube 8 allows the tube 8 with its mouthpiece 14, valve 16 and pressure gauge 20 to be quickly connected or disconnected from the envelope.

The self-sealing valve 22 may be one of a number of such valves readily available to the trade and is so arranged that when the arrangement 24 is disconnected, the valve automatically seals to lock in the air within the envelope.

The mouthpiece may, as in the first embodiment, be replaced by a hand pump or an electrically driven pump suitable for connection to a motorcar cigar lighter socket.

In use, the tube is connected to the envelope at the quick release connection 24 after which air is passed through the tube 8 and the valve 16 into the envelope. The pressure within the system is indicated by the pressure gauge and when the desired pressure is reached, no further air is passed into the envelope. The air within the envelope is retained therein and the unit is detached until required at a later time.

Although in both embodiments a pressure gauge similar to one used for testing motorcar tyres is illustrated, any readily available air pressure gauge may be adapted for use in the invention.

The invention is described as using hook and loop type fasteners. Any other belt fastening devices may, of course, be used, e.g. buckles or hook and eye fasteners. Part of the belt or fastener may include an elastic portion.

CLAIMS

1. A back-supporting device comprising a body-encircling belt incorporating therein at least one inflatable envelope adapted to provide support to the lumbar region of a user, means for inflating or deflating the envelope or envelopes, and indicator means for providing an indication of the pressure within the envelope.
2. A device according to claim 1. wherein the indicating means is a visual pressure gauge.
3. A device according to claim 2. wherein the pressure gauge comprises a graduated stem slidably mounted within a sleeve connected to the envelope or envelopes via a flexible tube.
4. A device according to claim 3. wherein the tube is provided with a two-way valve which is capable of allowing fluid to pass therethrough either into or out of the envelope or envelopes or to be locked therewithin.
5. A device according to claim 4. wherein the valve is actuatable by means of a digitally operable button.
6. A device according to any of the above claims wherein a composite unit comprising means for inflating the envelope or envelopes and the indicator means are readily detachable from and attachable to the envelope or envelopes.
7. A device according to claim 5. wherein a self-sealing valve is provided adjacent the envelope or envelopes and a quick release connection is provided between a flexible tube and the self-sealing valve.
8. A back-supporting device substantially as described herein with reference to Figures 1 and 2.
9. A back-supporting device substantially as described with reference to Figure 3.



Application No: GB 9615364.8  
Claims searched: 1 to 9

Examiner: Mr S.J.Pilling  
Date of search: 11 October 1996

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): A5R (RBQ, REYA), A3V (V1B2C, V9B5X)

Int CI (Ed.6): A61F 5/00, 5/01, 5/02, 5/03, 5/34, A41D 13/00

Other: ONLINE: WPI, JAPIO, CLAIMS

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
Y	US 4682587 (CURLEE) see column 4 lines 50 to 55, column 6 lines 3 to 44 and the figures, particularly Figure 1.	1,2,4
Y	US 4622957 (CURLEE) see column 4 lines 3 to 18 and the figures, particularly Figure 1.	1,2,4
Y	US 3343532 (ZUMAGLINI) see column 1 lines 12 to 13, column 2 lines 12 to 29 and the figures, particularly Figure 1 with regard to reference numeral 10.	1,2,4

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.